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REACTIONS OF STUDENTS TO RECEIVING GRADES.

BY- COHEN, KAREN C.
JOHNS HOPKINS UNIV., BALTIMORE, MD.

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ATTITUDE CHANGES OF STUDENTS UPON RECEIVING GRADES WERE STUDIED. MEASURES WERE DEVELOPED TO DETERMINE THE STUDENTS' (1) ATTITUDES TOWARDS GRADES AND SCHOOL, (2) EXPECTANCIES FOR FUTURE GRADES, AND (3) ESTIMATIONS OF ABILITIES. A REPRESENTATIVE SAMPLE OF 7TH- THROUGH 12TH-GRADE STUDENTS (1,000) WAS SELECTED. A QUESTIONNAIRE WAS ADMINISTERED TO ALL OF THE SUBJECTS IN THE EXPERIMENTAL GROUP BOTH BEFORE AND AFTER THEY HAD RECEIVED THEIR MID-TERM GRADES. SCHOOL RECORDS WERE ALSO USED TO GATHER DATA. THE RESULTS INDICATED THAT REPORT CARDS DID AFFECT STUDENT ATTITUDES. AFTER RECEIVING THEIR GRADES, STUDENTS REPORTED A GENERAL INCREASE IN THEIR EXPECTANCIES FOR THE NEXT TERM. ALSO CLOSELY RELATED TO THE GRADES RECEIVED WERE (1) ESTIMATIONS OF THE HIGHEST GRADES THE STUDENTS THOUGHT THEY COULD HAVE EARNED AND (2) ACCURACY OF THE STUDENTS' RECALL OF GRADES RECEIVED. GENERAL ATTITUDES TOWARDS GRADES AND SCHOOL WERE NOT AFFECTED BY PARTICULAR GRADES WHICH THE STUDENTS RECEIVED. (RS)

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Karen Cotzin Cohen

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REACTIONS OF STUDENTS TO RECEIVING GRADES

by

Karen Cotzin Cohen

A Dissertation submitted to The Johns Hopkins
University in conformity with the
requirements for the degree
of Doctor of Philosophy

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ABSTRACT

This paper presents the findings of a study attempting to measure the effects which receiving report cards has on students. Of specific concern were changes in students' expectancies for future performance, in their estimations of their own ability, in their attitudes towards grades, and in their attitudes towards school. Hypotheses were set forth and tested concerning both the direction and amount of change in these areas which would be related to the students' grades. The results of these tests are analyzed and discussed.

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K.C.C.

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I. INTRODUCTION: PROBLEM ON WHICH THE RESEARCH WAS FOCUSED

This study is concerned with the effect which receiving grades may have on students' attitudes towards school, on their attitudes towards grades, on their expectancies for future grades, and on their estimations of their own ability. There has been much argument as to the value of giving grades as well as to the effect which such grades may have on students' psychological development and later academic achievement. Very little work, however, has been done to measure objectively or specifically what these effects may be in the actual classroom setting, or in other words, to ascertain empirically whether or not the grades which the students themselves earn do in fact cause either positive or negative changes in either their attitudes or their expectations.

The following investigation was designed to explore the process of such a reaction to receiving grades. If effects are found which are supposedly caused by grades, then these effects and the factors associated with them can be described. If, on the other hand, there are no discernible effects or changes resulting from receiving grades, this finding will support empirically the proposition that grades are neither necessarily beneficial nor necessarily harmful to the students themselves--at least as far as the measures used can reveal--although they may be quite useful to the school.

II. OBJECTIVES AND HYPOTHESES

The general hypothesis of this study is that the greater the discrepancy between the grades a student expects to receive and the grades he actually does receive, the more change there will be in the attitudinal elements related to these grades. The specific predictions are as follows:

(1) Changes in expectancy for future grades or memory of past grades received:

Students who received grades higher than they had expected would have higher expectancies for future grades or would perceive or remember their received grades as lower than they had actually been; students who received grades lower than they had expected would either lower their expectancies for future grades or remember receiving grades higher than they had actually received; students receiving the grades they had expected would have no change in expectancy for future grades and would remember receiving the grades they had received accurately.

(2) Changes in estimation of their own ability:

Students receiving grades higher than they expected would raise their estimations of their own ability; students receiving grades lower than expected would lower their estimations of their own ability; students receiving the grades they expected would not change their estimations of their own ability.

(3) **Changes in attitude towards the value of grades:**

Students receiving grades higher than expected would change in attitude towards grades in a positive direction; students receiving grades lower than expected would change in attitude towards grades in a negative direction; students receiving the grades they expected would not change in attitude towards grades.

(4) **Changes in general attitude towards school:**

Students who receive grades higher than they expected would show positive changes in attitude towards school; students receiving grades lower than expected would show negative changes in attitude towards school; students receiving the grades they expected would have no change in attitude towards school.

III. RELATED LITERATURE

Two general areas of literature relate to the problem of studying the reactions of students to receiving grades. The first area encompasses theoretical statements and discussions which explain the uses of grades, the meaning of grades, and the problems caused by giving grades, elaborating specifically on the educational significance of these problems. The second area includes research or experimental investigations of the relationship between grades and (A) change in expectancy for future performance or level of aspiration, (B) change in self-estimation of ability, and (C) change in attitudes towards grades and school.

The Problem of Grades

The concern of educators with the topic of grading involves aspects as varied as the type of grading system to be used (Jarrett, C. D., 1963; Kelley, T. L., 1950; Odell, C. W., 1950; Chansky, N. M., 1964 a, b; Ransom, E. H., 1961; Barnes, E. H. and Barnes, K. F., 1962,) the reliability of grading systems currently in use (Clark, E. L., 1964; Coleman, W. and Cureton, E. E., 1954; Saxton, G. H., Blackman, L. S., and Treatakoff, M. I., 1963,) and the disadvantages of using grades (Sampson, E. E., 1963; Josephson, C. H., 1961; Leese, J., 1961; Doak, E. D., 1962; Johnson, 1942; Pemberton, 1962,) to mention but a few. Most of these articles and those similar to them focus on the confusion and troubles often caused by giving grades--problems which may involve teachers, students, administrators, and parents. The salient concern is that grades may have a detrimental effect on students' self concepts, on their attitudes, and on their motivation for future work, although studies of this latter area indicate that absence of grades decreases motivation in the classroom situation (Hawk, T. L. and DeRidder, L. M., 1963.)

The general conclusion of such theoretical statements and descriptive analyses of the uses and problems of a grading system is that although no single grading or marking system has necessarily been demonstrated to be better, more fair, or to cause significantly fewer problems than any other, nevertheless grading is a perennial problem for educators, particularly in terms of the damage that grades can do. This investigation hopefully will shed some empirical light on the dimensions of this problem by attempting first to determine whether or not receiving grades does have any effect on students' attitudes or expectancies and second to determine what these effects may be.

Related Research Investigations

In addition to the discussions and statements of concern with the problem of grades, there have been many investigations relating to the specific areas we wish to investigate, specifically expectancy for future grades or level of aspiration, self-estimation of ability, and attitudes towards grades and school. The majority of these related studies deal with these three phenomena generally and not necessarily in terms of their relation to grades which students earn in their actual courses. Those studies which do relate these three areas to grades will be discussed at greater length than other, less closely related investigations.

A. Grade Expectancy or Level of Aspiration

The majority of studies involving level of aspiration are concerned with defining the concept or with investigating the various factors associated with it. The concept "level of aspiration" is a broad one in terms of its definition and meaning to the individual as well as in its use. Gardner (1940), Frank (1941) and Lewin *et al.* (1944) present excellent reviews of the term and conclude that "level of aspiration" can refer only to a quantitative indication which an individual makes concerning his future performance in an activity. Such a general definition coincides with that of this study which defines level of aspiration by the grades which students think they will receive in the courses they are taking on their next report cards. Not all studies of level of aspiration and grades, however, rely on the individual's expressed indication of his performance, preferring instead to predict grade expectancies for individuals based on their scores on general tests of ability or aptitude although the individuals themselves may never have stated such aspirations explicitly and may, indeed, never have thought about them at all. (Red, S. B., McCary, J. L., and Johnson, B., 1962; Mitchell, V. W., 1959, 1963.) Many studies are concerned solely with developing specific instruments (or indices) to measure level of aspiration such as those by Anderson and Brandt (1939), Worrell (1951), Hills (1955) and Becker and Siegel (1962). But for the most part the method of measurement is relatively incidental to the uses to which the instrument is put.

Investigations which use such an instrument to study variables related to level of aspiration indicate that two major factors are of importance in determining what a person's level of aspiration may be: (1) membership in a particular culture or social group and (2) the individual's history of success and failure on the task or situation involved. Group membership seems to influence or change an individual's level of aspiration, particularly if he has knowledge of the group's performance on the relevant task. Successful individuals predict that they will do worse in the future than they had recently done and unsuccessful individuals that they would do better than their previous performance, all tending to adjust their levels of aspiration in the direction of the group's average performance.

(Anderson, H. and Brandt, H. F., 1939; Gould, R., 1939; Hilgard, E. R., Sait, E. N., and Margaret, G. A., 1940; Festinger, L., 1942.) But it should be noted that this finding holds true for "unsuccessful" individuals with or without knowledge of the group's performance on a task, since levels of aspiration have been demonstrated to be generally higher than levels of previous performance. (Lachman, S. J., 1961.)

This group influence appears to be less a factor in an individual's level of aspiration, however, than is his past history of "success" or "failure." In the academic situation specifically we find success and failure defined by the absolute value of grades received. Several studies report that past academic success (i.e. history of high grades) is associated with more realistic goal setting than is past academic failure (i.e. history of low grades) and that the more recent the "success" or "failure" experience the more it influences current setting of goals or levels of aspiration. (Byers, J. J., 1962; Lachman, S. J., 1961; and Sears, P. S., 1940, 1941.)

These studies support the findings of other investigations which attempt to change level of aspiration by experimental manipulation where again "success" and "failure" result in the progressive improvement or impairment of efficiency respectively, (Sears, R. R., 1937); where the more marked the failure the greater its effect on lowering level of aspiration, (Steisel, I. M. and Cohen, B. D., 1951); and where the more marked the failure the more subsequent goals deviate or vary from immediately prior performance (Gould, R., 1939; Sears, P. S., 1940.)

The present study is similar to many of those discussed in its attempt to measure students' levels of grade aspiration and to predict changes in these levels. Its difference lies in its attempt to determine the students' "successes" and "failures" neither by the absolute value of the grades the student receives nor by artificial manipulation of his grades, but rather by determining the accuracy of his predictions of his future grades. "Failure" here is defined as an individual's prediction which differs from the grade received regardless of where on the spectrum of grades his own scores may lie and "success" as an accurate prediction.

Previous studies involving accuracy of grade prediction have found that women are more accurate in their estimations of the grades they will receive in a course than are men (Sumner, F. C. and Johnson, E. E., 1949) and that high ranking students are more accurate predictors than low ranking students, who are, in turn, more accurate than middle-ranking students. (Gaier, E. L., 1961; Sumner, F. C. and Johnson, E. E., 1949.) These two studies of accuracy and level of aspiration, however, did not go on to determine whether or not this accuracy-inaccuracy dimension played a role in determining subsequent shifts or changes in level of aspiration.

B. Self-Estimations of Academic Ability

As with studies of level of aspiration, studies of self-estimation (of academic ability) are concerned with various ways of measuring or defining it, with the factors which are related to it, and with attempts to discover factors which can affect or change it. Various methods are available to measure self-estimation of ability, including inventories and evaluation sheets (Marshall, M., 1960;

Hollenbeck, G. P., 1961) and various rating techniques (Shen, E., 1925; Russell, D. H., 1953; Bruck, M. and Bodwin, R. F., 1962; Duel, H. J., 1958.) The method of measurement used in this investigation is defined principally by the students' estimations of grades, this time of grades they think they "could have received" in their courses if they had "tried their hardest from the beginning of the course." In addition the students rank themselves on scales ranging from "Very Bright" to "Not Bright At All" and rank their grades on scales which range from being better than "No One in Class" to better than "Everyone in Class."

Factors discovered which relate to self-estimation of ability include teacher and peer ratings, perceived parental ratings, and actual academic achievement. Both teacher and peer ratings of students correlate with the students' self evaluations, especially in the younger school years, (Russell, D. H., 1953) although the correlations are not high. Perceived parental estimation does correlate more highly with students' self evaluations (Cooper, J. B., and Lewis, John H., 1962; Morrow, W. R. and Wilson, R. R., 1961) as well as with students' actual academic achievements.

(Teahan, J. E., 1963; Barwick, J. M. and Arbuckle, D. S., 1962.)

The highest correlation with academic achievement, however, is found with students' estimations of themselves as students, although not necessarily with their general self-concepts according to one study, (Borislow, B., 1962.) Two other studies do find a relationship between academic achievement and general self-concept (Bruck, M. and Bodwin, R. F., 1962; and Fink, M. B., 1962,) and yet another finds no relationship between self concept and college grade achievement. (Gustav, A., 1962) We may conclude that academic achievement is probably related to self concept, particularly to those aspects of self-concept which involve the self estimation of academic ability. We are interested particularly in measuring how changes in such a self-estimation may be influenced by grades.

Experiments which attempt to manipulate variables in order to change self-concept find that one's self-estimation of ability can be changed in predicted directions by experimentally induced success and failure, (Cohen, A. I., 1961.) The extent to which they can be changed is dependent upon the degree of creditibility of those attempting to change them (Bergin, A. E., 1962; Aronson, E. A. and Golden, B. W., 1962.) Discrepancy between self-estimation and the evaluations made by other persons, however, may result in the subject's devaluating the other person or distorting his evaluations. (Harvey, O. J., Kelley, H. H., and Shapiro, M. M., 1957.) In the present study we cannot experimentally manipulate the students' grades in order to produce changes in their self-estimations of ability, but we hope to measure those changes which may occur in their self-estimations as a result of the grades they have actually earned.

C. Changes in Attitude

The discussion of literature concerning attitude change will be limited as far as possible to changes in attitudes involving grades or school specifically. Many models or theories have been devised to explain and predict changes in attitude as a general phenomenon, e.g. those of Osgood and Tannenbaum (1955), Katz and Stotland (1959) and Festinger (1957). The techniques of measuring various attitudes are as varied as the specific attitudes involved. In our study, however, attitudes towards grades are measured by specific questions involving rating the importance of grades, their relevance to later life, their importance to parents, and their importance to friends. Attitudes toward school are measured by lists of things the students report as liking about school, lists of things they dislike about school, the length of school day they would prefer relative to the one they currently have, and the length of vacation they would prefer.

Experimental attempts to change attitudes towards specific topics, especially attitudes towards school, indicate that the credibility of the source attempting to change the attitudes influences the extent to which such change takes place. (Osgood, C. E. and Tannenbaum, P. H., 1955; Aronson, E. A. and Golden, B. W., 1962.) Attitudes towards school and other topics, furthermore, change as the result of participation in some sort of educational project, be that "project" attending college for four years (Webster, H., 1958,) participating in a special summer program (Frankel, E., 1964,) or even taking a course in economics (Sewell, E. G., 1963.) These studies of change in attitude, however, fail to take into account the possible changes in attitude which may have occurred during the time interval involved without experimental interference or participation in some sort of educational project. Such a lack of control does not necessarily invalidate their findings, but there are two possible explanations of attitude change in these situations. The likely explanation is, of course, that the experimental situation or participation did produce changes in attitude; the possibilities remain, however, that the devices which measured these attitudes and attitude changes in the first place may also have produced some changes in attitude over a given period of time or that these changes may have occurred spontaneously. A similar criticism of lack of control is applicable to many of the studies of changes in self-estimation and changes in level of aspiration as well.

One study of the effect of grades on attitude change which does attempt to control for the effect of the grades and which is perhaps the most closely related to the present investigation is that by Bostrom, Vlandis, and Rosenbaum, "Grades as Reinforcing Contingencies and Attitude Change."* Here grades were used in an attempt to reinforce students' attitudes. Essays were assigned to be written on a value laden topic. These papers were then randomly assigned good grades, poor grades, or no grade. The same topic was then assigned for another essay at a later date. It was found that students who had received good grades had reinforced their originally expressed attitudes while students who had received either no grade or a low grade had not. We hope to find out whether or not such changes in attitude produced by grades which were experimentally manipulated have a parallel with changes in attitude produced by grades received in the actual classroom setting.

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* Bostrom, Robert N., Vlandis, John W., and Rosenbaum, Milton E., "Grades as Reinforcing Contingencies and Attitude Change," J. Ed. Psychol., 52:112-115, 1961.

IV. PROCEDURES: GENERAL DESIGN; POPULATION AND SAMPLE; DATA AND INSTRUMENTATION

General Design

The general design of this investigation involved administering a questionnaire to individual classrooms of students both before they received their mid-year report cards and then once again under similar conditions after they received their grades. Questionnaires were designed (See Appendix A) which attempted to measure the students' attitudes towards grades and school, their expectancies for future grades, and their estimations of their own ability. These various items were measured in several different ways whenever possible. In order to measure or control for the effect of "rehearsal," i.e. of having taken the questionnaire twice, only the second questionnaire was administered to some groups of students who were matched in essential characteristics to the experimental groups.

In brief:

EXPERIMENTAL GROUP	CONTROL GROUP
Answer Questionnaire I	________
Receive Grades	Receive Grades
Answer Questionnaire II	Answer Questionnaire II

Population and Sample

The students in this study ranged in age and grade level from the seventh through the twelfth grades inclusive. The classes were selected from different schools in the Baltimore area; included were public schools, private non-denominational schools, and private parochial schools. Approximately five different classes of students were seen in each of the eight schools involved. The selection procedure provided a representative sampling of students in different schools who were following different kinds of academic programs, who had varying future academic expectations, and who represented all types of ability levels as classified by the individual schools involved. In all, over 1,000 students were seen.

The control groups of classes were five in number selected to match five of the classrooms used in the experiment in terms of grade level and age, academic program followed, ability grouping, and future academic orientation. It was neither feasible nor practical to replicate all of the experimental groups since some of the schools had no duplications of groupings, and since, additionally, the results of a pilot study indicated that there were no significant effects caused by taking Questionnaire I itself.

Data and Instrumentation

Data concerning each student was gathered through the Questionnaires as well as from school records. Questionnaire I was administered to students approximately one or two days before they received their report cards and Questionnaire II approximately one week after they received them. These two questionnaires were identical in content and form with the exception that Questionnaire II had one additional question asking the students to list the grades they did receive on their recent report cards. School records were used for other information about the pupils, primarily to obtain the actual grades which the students did receive on their report cards and secondarily for their IQ scores, and various aptitude test scores when available.

V. ANALYSIS OF THE DATA AND FINDINGS

The questionnaires were designed to provide several different measures of the four areas under investigation. A coding scheme was developed for the information obtained from the questionnaires and the school records. (The Coding Scheme used appears in Appendix B.) Note should be made here that although students estimated their grades for each course individually, these grades were averaged together to give each student a single or average grade score. Grades in physical education or military drill were omitted from these averages since some of the schools involved did not keep records of them and few of the students reported them to us. The average score was used so that students taking varying numbers of courses could be compared with each other easily. The standard procedure by which these averages were obtained is outlined in the Coding Scheme in detail both for literal and numerical grades. No other variety was encountered in this study.

The information from the questionnaires along with additional information from the students' school records was punched and stored on IBM cards. A program was written for the 7094 Computer which compared each student's answer to each question on Questionnaire I with his corresponding answer on Questionnaire II and which punched this difference for each item on a new card. These differences or changes in attitude and expectancy were, then, the basic data which were analyzed to determine whether they were related to overestimation, accurate estimation, and underestimation of grades and if so, the nature of the relationship.

The presentation of findings has been divided into three sections: A., "Effect of Questionnaire I," B., "General or Group Changes in Attitude and Expectancy," and C., "Individual Changes as Related to Hypotheses and Predictions." The specific contents of the attitudes and expectancies used in this study, i.e. the distributions of the experimental group responses to Questionnaires I and II are not of immediate relevance to the analysis of change in attitudes and expectancies but will be covered incidentally in the presentation of findings. The group distributions are presented in complete detail in Appendix C.

A. Effect of Questionnaire I

In order to measure the possible effect which taking Questionnaire I might have had on the students' responses to Questionnaire II, only the second questionnaire was administered to five classes of students who formed a control group. These five classes were matched with five classes of the Total-Experimental Group in terms of school, age, grade level, sex, type of academic program followed, and ability level. An analysis was then made of the responses of this Control Group on all of the items of Questionnaire II compared with the responses of the five classes they matched in the experimental group hereafter called the "Matched-Experimental Group" as differentiated from the "Total Experimental Group." The chi-square statistic was used to test for the significance of any differences which might appear between the distributions of the responses of these two matched groups as well as for any differences in their grades received, intelligence and aptitude scores, or other characteristics mentioned.

Of the twenty-six comparisons made, on only two items were significant differences found. (1) The Control students, who had not taken Questionnaire I, reported themselves as having significantly lower estimations of their own ability as measured by the estimations of the grades they "could have" received if they "had tried their hardest from the beginning of the course" than those self-estimations reported by the students in the Matched-Experimental Group. This difference in estimation of potential appeared although there were no significant differences between the two groups with respect to the grades they actually did earn, with two other self-estimations of ability, or with four more objective estimations of ability obtained from their school records. The table below (see Table I) illustrates this difference in detail. Although statistically significant, the actual difference between the average estimation of ability in the Control Group and the average estimation of ability in the Matched-Experimental Group was 1.235 points. The average estimation of potential in the

Matched-Experimental Group was 87.447 points out of a possible 100 points (S.D. = 5.111 points) and that of the Control Group was 86.212 points (S.D. = 5.181 points). In other words, although there was a significant difference between the two groups on this item, the difference itself was not a large one.

TABLE I

CONTROL GROUP AND MATCHED-EXPERIMENTAL GROUP ESTIMATIONS OF GRADES THEY "COULD HAVE" RECEIVED

	Average Score 79 or Below	Average Score 80-89	Average Score 90 or Above	Total N
Control Group	12	90	21	123
Matched-Experimental	8	73	41	122
Total N	20	163	62	245

Chi-square = 9.021, 2 degrees of freedom, $p < .02$.

(2) The second item on which there was a statistically significant difference between the two groups involved

their attitudes towards school, particularly the number of things they listed as disliking about school. The Control Group listed significantly more items that they disliked about school than did the Matched-Experimental Group, although here again there were no significant differences between these two groups with respect to the four other items in the questionnaire measuring their attitudes towards school. Specifically, the difference was the following:

TABLE II

CONTROL GROUP AND MATCHED-EXPERIMENTAL GROUP
LIST OF ITEMS "DISLIKED" ABOUT SCHOOL

	Number of Items Listed							
	0	1	2	3	4	5	6	Total N
Control Group	30	1	13	42	25	9	2	122
Matched-Experimental	31	1	32	28	31	0	0	123
Total N	61	2	45	70	56	9	2	245

Chi-square = 22.465, 6 degrees of freedom, $p < .01$.

The actual difference was 0.428 items; the Control Group listed (on the average) 2.647 items they disliked about school (S.D. = 1.528) while the Matched-Experimental Group listed 2.219 items (S.D. = 1.276). Apart from these two differences between the Control Group and the Matched-Experimental Group no significant differences were found on any of the other dimensions studied.

In order to investigate further whether or not those differences which were found between the groups were attributable mainly to chance, since so few significant differences were found among such a large number of comparisons, or were the effect of Questionnaire I, a comparison was made of the Matched-Experimental Group's responses to these two items on Questionnaire I with their corresponding responses on Questionnaire II. The Matched-Experimental Group had no significant shifts or changes on either item.

Since the Matched-Experimental Group did not change or shift their estimations or attitudes on either of these two items, we may conclude either (1) that the effect of taking Questionnaire I was an inhibitory one, preventing any attitude or estimation change on two specific items, or

(2) that these two differences found between the groups were due to chance factors and not to the effect of the questionnaire. If the first case be true, then any shifts or changes which may appear in the Experimental Group will occur in spite of Questionnaire I and not because of it; if the second be true, then the questionnaire had no effect at all on the attitudes or expectancies involved. In either case we must conclude that any shifts or changes which may appear in the Experimental Group are due to some factor other than the experimental situation itself and were not caused by the questionnaires.

B. General or Group Changes in Attitude and Expectancy

There was a great deal of attitude and expectancy change on the part of the individual students in the Experimental Group during the time period extending from two days before through one week after they received their report cards, and there was more change or variation on some of the questionnaire items than on others. Table III, "Correlations of Experimental Group Responses to Questions on Questionnaire I with Corresponding Questions on Questionnaire

TABLE III

CORRELATIONS OF EXPERIMENTAL GROUP RESPONSES TO QUESTIONS ON QUESTIONNAIRE I WITH CORRESPONDING QUESTIONS ON QUESTIONNAIRE II

Questionnaire Item	Correlation Value (N = 879)
1. What do you plan to do after graduation from high school?	.96
2. What grades do you think you will receive in these courses on your next report card	.85
3. What grades do you think you could have received in these courses if you had tried your hardest from the beginning of the term	.80
4. Would you like to go to school each day for more time _____, the same time _____, or less time _____ How much more or less time? _____	.67
5. Would you like vacations which are longer _____, the same _____, or shorter _____ How much longer or shorter? _____	.63
6. List all of the things you LIKE ABOUT SCHOOL	.54
7. List all of the things you DISLIKE ABOUT SCHOOL	.49

TABLE III--Continued

Questionnaire Item	Correlation Value (N = 879)
8. I am Very bright - - - Not bright at all	.86
9. Schoolwork for me is Very easy - - - - - - - - Very Hard	.78
10. Getting good grades is Very important - Not at all important	.65
11. To my parents, getting good grades is Very important - Not at all important	.75
12. I get better grades than No one in class - - Everyone in class	.90
13. In terms of later life, grades are Very related - - Not at all related	.72
14. To most people, being brilliant is Very important - Not at all important	.50
15. To me, being brilliant is Very important - Not at all important	.67
16. To my friends, getting good grades is Very important - Not at all important	.67

II," presents the correlations of each individual's response to each item before he received his report card with his corresponding response after he had received it. Since there was so much individual change, we were interested in measuring whether or not there were any significant general or group changes on any of the attitude or expectancy items before continuing the investigation of the relationship between each individual's changes and the accuracy of his estimation of the grades he would receive. Any consistent and significant changes in the distributions of the group's responses would be manifestations of the general effect which report cards may produce.

A comparison was thus made of the distributions of the Experimental Group responses to each item of Questionnaire I with the distributions of their responses to the corresponding items on Questionnaire II using the Chi-square statistic to test for the significance of any differences found. Of the seventeen items compared, statistically significant shifts or changes were discovered on five items. The items on which significant shifts or changes appeared were the following:

(1) Expectancy for future grades.--Students thought that they would receive higher grades or do better on their next report cards (approximately twenty weeks hence) than they had thought they would receive on their recent report cards. The mean of all the grades the students expected to receive immediately before they received their report cards was 81.882 (S.D. = 6.762); the mean of the grades the students expected to receive in the new term was 84.206 (S.D. = 6.486). This difference or change in their expectancies of 2.324 points was significant beyond the .001 level and represented the largest shift on any of the items measured. Such a shift or change either reflects an expectation that the work will be easier in the new term or at least more easily graded or reflects a determination to work harder or do better in the new term. In either case, this shift in expectancy is in a positive direction.

(2) Number of items listed as liked about school.--There was a statistically significant although quantitatively small shift or change in the number of items the students listed as liking about school, a decrease of 0.175 items. Before receiving their report cards the average

number of items which students listed was 3.238 (S.D. = 1.390) and after receiving report cards 3.063 items (S.D. = 1.411), ($p < .01$).

(3) Estimation of the importance of getting good grades.--Although the students thought that getting good grades was fairly important on both questionnaires they lowered their estimation of the importance of good grades after receiving their report cards. On a scale on which "1" assigned the highest importance to getting good grades and "7" the least importance with seven possible and different rankings allowed, they shifted from their original average ranking of 1.819 points (S.D. = 1.271) to an average ranking of 2.151 points (S.D. = 1.406), ($p < .001$).

(4) Estimation of the importance of getting good grades to parents.--Parents were also reported as having lowered their estimations of the importance of getting good grades, although the parents' reported estimations were consistently higher than those of their children at both administrations of the questionnaires. This change was from an average ranking of 1.662 points (S.D. = 1.129) to a ranking of 1.835 points (S.D. = 1.197) on the same scale as (3)

above where "1" represented getting good grades as being of the highest importance and "7" as being of no importance at all, ($p < .001$).

(5) Estimation of the importance of getting good grades to friends.--Friends, to whom getting good grades was consistently less important than it was either to the students themselves or to the students' parents, also lowered their estimations of the importance of getting good grades from an average ranking of importance of 2.707 points (S.D. = 1.557) to 2.801 points (S.D. = 1.485) on the same scale as (3) and (4) above, ($p < .01$).

Aside from these five changes in the group's responses, there were no significant general or group shifts in the distributions of any of the other items measuring their attitudes and expectancies. We may conclude, then, that the general effect of receiving report cards, regardless of the contents of those report cards, was to change the group's expectancies for future performance--students expect to do better in the new term than they had expected to do in the past term. A second effect of report cards was to lower the students' estimations of the importance of getting good grades--they lowered this estimation on three items measuring this importance: their own estimations, their parents' reported estimations, and their friends' reported estimations. Finally, there was also a slight decrease in the number of items students listed as liking about school, but this more negative attitude towards school was not reflected on any of the other items measuring attitude towards school and probably does not represent any widespread dissatisfaction with school since students also list consistently more items that they like about school than they list that they dislike about school.

C. Individual Changes as Related to Hypotheses and Predictions

Chapter II, "Objectives and Hypotheses," outlines predictions for changes in the attitudes or expectancies of individuals as they relate to the accuracy or inaccuracy of their original predictions of the grades they would receive. Questionnaires I and II were designed to provide several measures, whenever possible, of change in these four general areas, i.e. expectancy for future performance, estimation of ability, attitude towards grades, and attitude towards school. A great deal of individual variation was noted on all of the questionnaire items (See Table III), and the change on some of the questionnaire items was related to the change on some of the others. The change for each individual on each questionnaire item was compared with his own change on each of the other questionnaire items, and Appendix D: "Significant Correlated Changes in Attitudes and Expectancies" presents the pairs of items for which these correlated changes were statistically significant.

Such findings, although statistically significant, are hardly surprising, for they serve to indicate that many of the questionnaire items which attempted to measure the same attitude or expectancy were influenced in similar directions during the period of this investigation. Whether these changes are correlated with the accuracy of the students' predictions of the grades they would receive, however, is the key test of the hypotheses underlying this investigation.

Of the 879 students in the Experimental Group, 306 students underestimated the grades they would receive, (i.e. received grades higher than they had expected), 120 students estimated the grades they would receive accurately, (i.e. received the grades they had expected to receive), and 453 students overestimated the grades they would receive, (i.e. received grades lower than they had expected to receive).

This accuracy or inaccuracy of grade prediction was not related significantly to any of the following variables: school, grade in school, academic level, future plans, sex, or intelligence quotient scores. There was, however, a correlation between accuracy of estimation of grades and the absolute value of the grades which the students actually did receive on their report cards of .381. Students who received grades which were objectively high had tended to underestimate the grades they would receive on their report cards while students who received grades which were objectively low had tended to overestimate the grades they would receive. In all ranges of the grade scale, however, there were students who overestimated the grades they would receive, students who underestimated the grades they would receive, and students who estimated the grades they would receive accurately. Furthermore, although the value of the grades received did correlate with error of estimation, it did not correlate significantly with any change in attitude or expectancy for any of the other questionnaire items. This correlation may be due in part to an artifact of the grading scale. This scale has an upper limit of 100 points and a lower limit of 55 points. Consequently, students receiving very high grades would have much more room for error in the direction of underestimating their grades than they would in overestimating them while students receiving very low grades would have much more room for error in overestimating their grades than they would in underestimating them.

Comparisons were made of the type and amount of error in estimation for each individual and compared with the type and amount of change he displayed on each of the questionnaire items. The results of these comparisons are presented below.

Change in Expectancy for Future Grades or Memory of Past Grades

Despite a general increase in the group grade expectancies from Questionnaire I to Questionnaire II, many of the students lowered their grade expectancies during this period. The correlation between the direction and amount of students' change in grade expectancy and the degree of accuracy or inaccuracy of their original predictions was .46, ($p < .001$). This significant finding confirmed the study's first hypothesis, i.e. that students who received grades higher than they had expected to receive would then raise their expectancies for future grades, that students who received the grades they expected to receive would not change their future grade expectancies, and that students who received grades lower than they expected to receive would lower their expectancies for future grades. Table IV presents the details of this finding.

The alternative prediction concerning change in expectancy was that students who received grades higher than they had expected to receive would remember or report receiving lower grades than their school records showed, that students who received the grades they expected to receive would remember or report their grades accurately, and that students who had received grades lower than they had expected would remember or report that they had received higher grades than their school records would show. This

TABLE IV

ACCURACY OF ESTIMATION AND CHANGE IN GRADE EXPECTANCY

	Lowered Expectancy	No Change in Expectancy	Raised Expectancy	Total
Underestimators	25	49	232	306
Accurate Estimators	19	17	84	120
Overestimators	100	67	286	453
Total	144	133	602	879

Chi-square = 73.95, 4 degrees of freedom, $p < .001$.

prediction was strikingly confirmed. The correlation between the direction and amount of each student's error in prediction of his grades and of his error in reporting the grades he had received was .751 ($p < .001$). (See Table V for details.)

From these two findings it is evident that the accuracy of the students' estimations of the grades they would receive is highly related to their future grade expectancies as well as to their memory or reports of the grades they did

TABLE V

ACCURACY OF ESTIMATION AND ACCURACY OF REMEMBERING (REPORTING) GRADES RECEIVED

	Report Grades Lower than Records Show	Report Grades Accurately	Report Grades Higher than Records Show	Total
Underestimators	50	191	65	306
Accurate Estimators	12	80	28	120
Overestimators	35	235	183	453
Total	97	506	276	879

Chi-square = 44.703, 4 degrees of freedom, $p < .001$.

receive. The effect of grades on students' expectancies, therefore, depends on how these expectancies were related to their actual grades. Although there is a general trend to increase expectancies for the new term, those students who received lower grades than they had expected to receive subsequently adjust their future expectancies in a downward direction while those students who received grades higher than they had expected subsequently adjust their future expectancies in an upward direction. The total effect, then, is one of a realistic adjustment to the grades received.

The distortion of grades reported or memory of grades received, however, presents an even more interesting effect of grades, especially for the students who reported receiving grades lower than those they had actually earned. It appears that the error in reporting grades received is highly related to the error originally made in grade estimation, almost as if the grades themselves had only a partial effect on the students involved--that the students distorted their perceptions or reports of these grades in the direction of their original predictions. Furthermore, this distortion had to be a rather large one, i.e. amounting to at least five grade points, in order for it to appear at all since a discrepancy of but two or three points on only one subject would disappear in the averaging process.

Changes in Estimation of Ability

Although no group changes appeared in any of the estimations of ability or related items from Questionnaire I to Questionnaire II, there were individual changes in these items during the time period involved. The questionnaires included one direct measure of self-estimation of academic ability, the grades the students thought they could have received in their courses if they had tried their hardest from the beginning of the term. One indirect measure of their estimations of their academic ability was also included, i.e. their rankings of themselves on the scale ranging from "I am very bright" to "I am not bright at all." In addition, two items possibly related to self-estimations of ability were included: their rankings on "To me, being brilliant is . . . very important . . . not at all important," and "To most people, being brilliant is . . . very important . . . not at all important."

The general prediction for changes on all of these items was that students who had received grades higher than expected would raise their estimations of their own academic ability, that students who received grades lower than they expected would lower their estimations of ability, and that students who received the grades they expected would not change their estimations of their own ability. Theoretically the item on which the most change would appear would be the first one mentioned, namely the grades the students thought they could have received in their courses if they had tried their hardest; the change on the other items would be less closely related to accuracy of original prediction if related at all.

This hypothesis for change in the direct measure of self-estimation of ability was confirmed. The correlation between accuracy of estimation and change in estimation of ability was .636, $p < .001$. Students who underestimated the grades they would receive subsequently raised their estimations of their own ability while students who overestimated the grades they would receive subsequently lowered their estimations of their own ability. (See Table VI.)

On the indirect self-estimations of ability, i.e. the students rankings of how bright they were, there was very little change during the time period from Questionnaire I to Questionnaire II. The shifting or changing which did occur, however, was not found to be related to accuracy of original estimation nor was it related to change on any of the other questionnaire items. More individual change

TABLE VI

ACCURACY OF PREDICTION AND CHANGE IN ESTIMATION OF ABILITY

	Lowered Estimations	No Change in Estimations	Raised Estimations	Total
Underestimators	86	61	159	306
Accurate Estimators	42	31	47	120
Overestimators	222	83	148	453
Total	350	175	354	879

Chi-square = 35.87, 4 degrees of freedom, $p < .001$.

appeared in the two items measuring the importance of being brilliant. These changes, however, were not found to be related to the accuracy of the original grade estimations nor were they related to any of the other questionnaire items except each other. Students who thought being brilliant more important on Questionnaire II than they had reported on Questionnaire I reported also that most people's thoughts on the importance of being brilliant had shifted in the same direction; similarly, students who thought being brilliant less important reported that most people had also changed their opinions in the same direction.

It would appear, then, that changes in estimations of ability, specifically estimations of academic ability as defined by the students grades they feel they could have earned, were related to the grades they had received: the students who received grades higher than they had expected raised these estimations of their own ability and students who received grades lower than they had expected lowered them. The estimations of their general brightness, however, were not affected by the grades they received and did not change very much during the time period of this study. Similarly their estimations of the importance of being brilliant were also unaffected by their accuracy of estimation or by the grades they did receive.

Changes in Attitudes towards Grades

Although our hypotheses were confirmed for the first two areas discussed, they were not confirmed for changes in attitude towards grades. No significant relationships were discovered between the individual's accuracy of grade prediction and their subsequent shift on any of the items measuring attitude towards grades. General or group shifts in attitude towards grades have already been discussed in Section B of this Chapter, "General or Group Changes in Attitude and Expectancy," when it was found that all students as a group had lowered their estimations of the importance of grades.

It also appears that each individual's change in attitude towards grades was correlated with his change in estimation of his position in class as well as with his change in estimation of how bright he was. Students who thought grades more important in Questionnaire II than they had in Questionnaire I also reported that they stood higher in their class and were brighter than they had previously reported while students who thought grades less important also reported that they stood lower in their class and were less bright than they had previously reported, although these correlations are quite small. (See Appendix D: "Significant Correlated Changes in Attitude and Expectancy," Numbers 5 and 7 for specific details.) None of these individual changes, however, were significantly related to the accuracy or inaccuracy of the students' original predictions. These correlated changes merely indicate that students who changed their attitudes were inclined to change them consistently rather than randomly, and that items measuring similar attitudes were similarly affected during the time period involved in this study.

Changes in Attitudes towards School

As with changes in attitudes towards grades, there were no significant relationships found between accuracy of predictions and any of the items measuring change in attitude towards school, although here again the students displayed individual consistency in their changes. Students who wanted a shorter school day on Questionnaire II than they had wanted to Questionnaire I also listed fewer items that they liked about school; students who wanted a longer school day on Questionnaire II than they had wanted on Questionnaire I also listed more items that they liked about school. (See Appendix D: Item Number 2.)

One other interesting finding appeared, again displaying consistency of a sort, and that was the relationship between change in number of items liked about school and number of items disliked about school: students who listed more items they liked about school on Questionnaire II than they had listed on Questionnaire I also listed more items they disliked about school; students who listed fewer items that they liked also listed fewer items that they disliked. No relationship was discovered, however, between these changes in attitude and the students estimations of the grades they would receive.

VI. SUMMARY

This study was designed to measure the possible effects which report cards have on students, particularly on changing their future grade expectancies or levels of aspiration, on changing their estimations of their ability, and on changing their attitudes towards grades and school. Questionnaires were designed to measure these four areas and were administered to students both before and after they received their report cards. The second questionnaire alone was administered to a control group of students in order to measure the effect which the first questionnaire itself might have on their attitudes and expectancies.

These questionnaires were administered to students one or two days before they received their mid-year report cards and then again one week after they received them. Students were selected from several different schools, including private non-denominational schools, private parochial schools, and public schools. The students ranged in age from the seventh grade through the senior year in high school, represented all levels of ability, followed various types of programs, (e.g. academic, vocational, general) and were of both sexes. Over 1,000 students answered the questionnaires.

Predictions were made for individual changes in attitude and expectancy based on the accuracy of the students' original estimations of the grades they would receive. The general assumption underlying these predictions was that students who underestimated the grades they would receive would change their attitudes and expectancies in a direction positive to their original attitudes and expectancies, students who received the grades they expected would not change their attitudes and expectancies, and students who overestimated the grades they would receive would change their attitudes and expectancies in a negative direction.

In brief, the findings of this study were the following:

(1) _Effect of Questionnaire I_.--No significant changes in attitude or expectancy were produced by the measuring instrument itself, i.e. the first questionnaire.

(2) General Effect of Report Cards.--The general reaction to receiving grades involved significant changes in two areas: the students' expectancies for their future performance and their estimations of the importance of grades. After receiving their report cards there was a general rise in the students' expectancies for grades in the new term, or in other words, the students expected to do better in the new term than they had expected to do in the last term. Students also lowered their estimations of the importance of grades after receiving their report cards on several items measuring this attitude.

(3) Individual Changes in Attitude as Related to Hypotheses.--The hypotheses concerning attitude and expectancy change were confirmed for two of the four areas measured, i.e. for changes in the students' expectancies for future performance and their estimations of their academic ability. Hypotheses concerning changes in attitudes towards school and in attitudes towards grades were not confirmed. The significant findings were the following:

(a) Students who received grades higher than they expected raised their expectancies for future performance, students who received the grades they expected did not change their expectancies for future performance, and students who received grades lower than they expected lowered their expectancies for future performance. The correlation between amount and direction of original error with amount and direction of change in expectancy was .460, $p < .001$.

(b) Students who received grades higher than they expected reported that they had received grades lower than their actual school records showed, students who received the grades they expected reported their grades accurately, and students who received grades lower than they expected reported receiving grades higher than their school records showed. The correlation between amount and direction of original error with that of error in reporting grades was .751, $p < .001$.

(c) Students who received grades higher than they expected raised their estimations of their academic ability, students who received the grades they expected did not change their estimations of their academic ability, and students who received grades lower than they expected lowered their estimations of their academic ability. The correlation between amount and direction of original error and amount and direction of change in estimation was .636, $p < .001$.

(d) Students did not change their estimations of how bright they were in general nor did they change their estimations of the importance of being brilliant.

(e) Students did change their attitudes towards the importance of getting good grades, but this change was a general one, unrelated to the accuracy or inaccuracy of their original grade estimations. This group change was in a negative direction, devaluing the importance of getting good grades.

(f) Students did not change their attitudes towards school during the time period of the investigation.

(g) Consistency appeared in individual attitude change; students who changed their attitudes on various items changed them in the same direction on related items rather than in random directions.

VII. CONCLUSIONS

Report cards, then, do affect students. After receiving them students report a general increase in their expectancies for the next term. They also report a general devaluation of the importance of getting good grades. Whether these general reactions are beneficial or harmful, however, is a debatable point. Certainly high hopes for the new term are to be preferred to discouragement. The de-emphasis on the importance of grades may similarly be a good sign if there is a simultaneous increase in the importance of acquiring knowledge for its own sake. Such an increase in the value of learning, however, was not measured in this study's questionnaires and surely cannot be assumed. The likely explanation is that getting good grades simply was less important to the students at the second questionnaire administration, as they report. The imminence of reports focuses the students' attention and anxiety on the subject of grades, but once this marking event has passed the subject is neither so anxiety provoking nor commands so much attention. It would be interesting to administer these or similar questionnaires to students at various times during a school year in an effort to determine whether or not there are similar reactions to mid-term reports and to important examinations as well.

Individual changes or variations in expectancy and estimations of academic ability also appear to be related to receiving report cards, although here the amount and direction of change is not a general phenomenon, but is related to the students' original expectancies of the grades they would receive. Not only do the students change their future grade expectancies according to the grades they did receive, but they also distort their memory, or at least their reports of their grades, in the directions of their original estimations. Changes in students' attitudes towards school, towards grades, and in their general estimations of themselves do not appear to be related to their original grade expectancies.

The items most closely related to grades, i.e. expectancy for future grades, estimation of the highest grades the students think they could have earned, and memory of grades are influenced by the particular grades which the students receive. Less closely related items, however, such as general attitude towards grades and general attitude towards school are not affected by the particular grades which the students receive. It would be interesting to administer the questionnaires to students at several different times in order to follow their attitude and expectancy changes throughout the course of an entire school year. A measure could then be obtained both of the duration and stability of these changes and of the degree to which they are related to grades.

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APPENDIX A

QUESTIONNAIRES I AND II

QUESTIONNAIRE I

DIRECTIONS

Try to go through this questionnaire quickly. Answer all of the questions in order, and do not spend too much time on any single question.

Instructions for most of the questions are given on each page. If you have a problem, raise your hand and a research worker will come to you to answer it.

Feel free to answer exactly the way you feel, because no one in your school will ever see any of your answers.

Begin by filling in the information at the bottom of the page. Then go on to the rest of the questionnaire.

Today's date ______________________________

Your School's Name ________________________

Your Grade in School ______________________

Your Name _________________________________

On the form below, please list all of the courses you are taking this year. Then fill in Columns I and II in the following way:

COLUMN I: Fill in the grades you think you will receive in these subjects on your next report card.

COLUMN II: Fill in the grades you think you could have received in these subjects if you had tried your hardest from the beginning of the course.

COURSES YOU ARE TAKING	COLUMN I Grades you think you will receive	COLUMN II Grades you could have received

What do you plan to do after graduation from high school?

____

Would you like to go to school each day for (check one)

more time _____, the same time _____, or less time _____?

How much more or less time?____________________________

Would you like a summer vacation which is

longer _____, about the same _____, or shorter _____?

How much longer or shorter?________________________

Please list below all of the things you

LIKE ABOUT SCHOOL	DISLIKE ABOUT SCHOOL

For the following statements, put an "X" in the box which best fits your opinion. For example, in answering the statement

As a color, green is

VERY PRETTY	☐	☐	☐	☐	X	☐	☐	VERY UGLY

you would put an "X" in the first box if you think green is very pretty, in the last box if you think it is very ugly, or in any other box which expresses your opinion. The example shows an "X" in the fifth box, representing the opinion that green is slightly or somewhat ugly.

I am

VERY BRIGHT	☐	☐	☐	☐	☐	☐	☐	NOT BRIGHT AT ALL

Schoolwork for me is

VERY EASY	☐	☐	☐	☐	☐	☐	☐	VERY HARD

Getting good grades is

VERY IMPORTANT	☐	☐	☐	☐	☐	☐	☐	NOT AT ALL IMPORTANT

To my parents, getting good grades is

VERY IMPORTANT	☐	☐	☐	☐	☐	☐	☐	NOT AT ALL IMPORTANT

I get better grades than

NO ONE IN CLASS	☐	☐	☐	☐	☐	☐	☐	EVERYONE IN CLASS

In terms of later life, grades are

VERY RELATED	☐	☐	☐	☐	☐	☐	☐	NOT AT ALL RELATED

To most people, being brilliant is

VERY IMPORTANT	☐	☐	☐	☐	☐	☐	☐	NOT AT ALL IMPORTANT

To me, being brilliant is

VERY IMPORTANT	☐	☐	☐	☐	☐	☐	☐	NOT AT ALL IMPORTANT

To my friends, getting good grades is

VERY IMPORTANT	☐	☐	☐	☐	☐	☐	☐	NOT AT ALL IMPORTANT

QUESTIONNAIRE II

DIRECTIONS

Try to go through this questionnaire quickly. Answer all of the questions in order, and do not spend too much time on any single question.

Instructions for most of the questions are given on each page. If you have a problem, raise your hand and a research worker will come to you to answer it.

Feel free to answer exactly the way you feel, because no one in your school will ever see any of your answers.

Begin by filling in the information at the bottom of the page. Then go on to the rest of the questionnaire.

Today's date ______________________________

Your School's Name ______________________________

Your Grade in School ______________________________

Your Name ______________________________

On the form below, please list all of the courses you are taking this year. Then fill in Columns I, II, and III as follows:

COLUMN I: Fill in the grades you think you will receive in these subjects on your final report card.

COLUMN II: Fill in the grades you think you could have received in these subjects if you had tried your hardest from the beginning of the course.

COLUMN III: Fill in the grades you actually did receive in these courses on your last report card.

COURSES YOU ARE TAKING	COLUMN I Grades you think you will receive	COLUMN II Grades you could have received	COLUMN III Grades you did receive

What do you plan to do after graduation from high school?

____

Would you like to go to school each day for (check one)

more time _____, the same time _____, or less time _____?

How much more or less time? ______________________________

Would you like a summer vacation which is

longer _____, about the same _____, or shorter _____?

How much longer or shorter? __________________________

Please list below all of the things you

LIKE ABOUT SCHOOL	**DISLIKE ABOUT SCHOOL**
______________________________	______________________________
______________________________	______________________________
______________________________	______________________________
______________________________	______________________________
______________________________	______________________________

For the following statements, put an "X" in the box which best fits your opinion. For example, in answering the statement

As a color, green is

VERY PRETTY					X			VERY UGLY

you would put an "X" in the first box if you think green is very pretty, in the last box if you think it is very ugly, or in any other box which expresses your opinion. The example shows an "X" in the fifth box, representing the opinion that green is slightly or somewhat ugly.

I am

VERY BRIGHT								NOT BRIGHT AT ALL

Schoolwork for me is

VERY EASY								VERY HARD

Getting good grades is

VERY IMPORTANT								NOT AT ALL IMPORTANT

To my parents, getting good grades is

VERY IMPORTANT								NOT AT ALL IMPORTANT

I get better grades than

NO ONE IN CLASS								EVERYONE IN CLASS

In terms of later life, grades are

VERY RELATED								NOT AT ALL RELATED

To most people, being brilliant is

VERY IMPORTANT								NOT AT ALL IMPORTANT

To me, being brilliant is

VERY IMPORTANT								NOT AT ALL IMPORTANT

To my friends, getting good grades is

VERY IMPORTANT								NOT AT ALL IMPORTANT

APPENDIX B

CODING MANUAL

Column 1: Code number for Name of School

Column 2: Code number for Grade in School of Student (School Records)

1 = 7th grade
2 = 8th grade
3 = 9th grade
4 = 10th grade
5 = 11th grade
6 = 12th grade

Columns 3 & 4: Code numbers for Names of Students (School Records)

Column 5: Sex of Student (School Records)

1 = male
2 = female

Column 6: Academic Class Level as Designated by School (School Records)

1 = superior
2 = high average
3 = average
4 = low average
5 = basic

Column 7: Plans after high school (Questionnaire II)

1 = college and further professional training beyond college e.g. medical school, law school, Ph.D., etc.
2 = college
3 = junior college
4 = vocation with further training program, e.g. nursing, airline stewardess, secretarial course, work for I.B.M., executive training program, etc.
5 = night school and job during the day

6 = military service (male or female)
7 = work or job
8 = marriage
9 = undecided

Columns 8 and 9: Grades you think you will receive (Questionnaire II)

Average here the grades for all courses listed in this column, excluding "Gym" and "Military Drill" if they are mentioned; include all other courses. If the grades are in letter form rather than numerical, convert them to numerical averages by the following table:

A+ = 97.5	B+ = 87.5	C+ = 77.5	D+ = 67.5	F+ = 57.5
A = 95	B = 85	C = 75	D = 65	F = 55
A- = 92.5	B- = 82.5	C- = 72.5	D- = 62.5	

Columns 10 and 11: Grades you could have received (Questionnaire II)

Average here the grades for all courses listed in this column using the same method as for Columns 8 and 9.

Columns 12 and 13: Grades you did receive (Questionnaire II)

Average here the grades for all courses listed in this column using the same method as for Columns 8 and 9.

Column 14: Desired length of school day (Questionnaire II)

Code responses to both questions according to the following table:

1 = more than two hours less time desired each day

2 = 1 hour - 2 hours less time desired each day
3 = 1 minute - 59 minutes less time desired each day
4 = same time desired
5 = 1 minute - 59 minutes more time desired each day
6 = 1 hour - 2 hours more time desired each day
7 = more than 2 hours more time desired each day

Note: If any students check either "more time" or "less time" without specifying how much more or less time, code the "more time" response as "5" and the "less time" response as "3."

Column 15: Desired length of vacations (Questionnaire II)

1 = more than 1 month longer (30 days) desired
2 = 21 - 30 days longer
3 = 11 - 20 days longer
4 = 1 - 10 days longer
5 = same as now
6 = 1 - 10 days shorter
7 = 11 - 20 days shorter
8 = 20 - 30 days shorter
9 = more than 1 month (30 days) shorter

Note: If any students check either "longer vacation" or "shorter vacation" without specifying how much longer or shorter, code "longer vacation" as "4" and "shorter vacation" as "6."

Column 16: List of things liked about school (Questionnaire II)

Put here the number of different things listed; plural words count as "1," e.g. "teachers," "classes," "kids," etc. However, if teachers are named, e.g. "Mr. Jones" and "Miss Smith," each name counts as "1." The only response which is not counted is the simple word "nothing." If the word "nothing" appears it is counted as one additional "dislike" item. Similarly, if the word "nothing" appears in the "dislike" column, one additional point is added to this column. If any students list more than nine items, count the total as "9."

Column 17: Number of things disliked about school (Questionnaire II)

See instructions for Column 16.

Column 18: I am very bright . . . not bright at all (Questionnaire II)

Put here the number of the box in which the "X" appears; 1 = first box, 2 = second, etc. . . . 7 = last box across the row.

Column 19: Schoolwork for me is very easy . . . very hard (Questionnaire II)

Put here the number of the box in which the "X" appears.

Column 20: Getting good grades is very important . . . (Questionnaire II)

Column 21: To my parents, getting good grades is . . . (Questionnaire II)

Put here the number of the box in which the "X" appears.

Column 22: I get better grades than . . . (Questionnaire II)

Put here the number of the box in which the "X" appears.

Column 23: In terms of later life, grades are . . . (Questionnaire II)

Put here the number of the box in which the "X" appears.

Column 24: To most people, being brilliant is . . . (Questionnaire II)

Put here the number of the box in which the "X" appears.

Column 25: To me, being brilliant is . . . (Questionnaire II)

Put here the number of the box in which the "X" appears.

Column 26: To my friends, getting good grades . . . (Questionnaire II)

Put here the number of the box in which the "X" appears.

Columns 26 through 35: Blank

Columns 36 and 37: Average of the grades the students did receive from their school records.

Use the same method for this average as for that appearing in Columns 8 and 9.

Columns 38 and 39: Grades you think you will receive (Questionnaire I)

Average here the grades for all courses listed in this column using the same method as for Columns 8 and 9.

Columns 40 and 41: Grades you could have received (Questionnaire I)

Average here the grades for all courses listed in this column using the same method as for Columns 8 and 9.

Column 42: Desired length of school day (Questionnaire I)

Code same as Column 14.

Column 43: Desired length of vacation (Questionnaire I)

Code same as Column 15.

Column 44: List of things liked about school (Questionnaire I)

Code same as Column 16.

Column 45: List of things disliked about school (Questionnaire I)

Code same as Column 17.

Column 46: I am very bright . . . (Questionnaire I)

Code same as Column 18.

Column 47: Schoolwork for me is very easy . . . (Questionnaire I)

Code same as Column 19.

Column 48: Getting good grades is very important . . . (Questionnaire I)

Code same as Column 20.

Column 49: To my parents, getting good grades is . . . (Questionnaire I)

Code same as Column 21.

Column 50: I get better grades than . . .
(Questionnaire I)

Code same as Column 22.

Column 51: In terms of later life, grades are . . .
(Questionnaire I)

Code same as Column 23.

Column 52: To most people, being brilliant is . . .
(Questionnaire I)

Code same as Column 24.

Column 53: To me, being brilliant is . . .
(Questionnaire I)

Code same as Column 25.

Column 54: To my friends, getting good grades is . . .
(Questionnaire I)

Code same as Column 26.

Columns 55 through 63: Blank

Columns 64 and 65: Verbal Aptitude Percentile Ranking
(School Records)

Columns 66 and 67: Math Aptitude Percentile Ranking
(School Records)

Columns 68, 69, and 70: Intelligence Quotient Scores
(School Records)

Column 71: Number of times absent during current school year
(School Records)

Column 72: Number of times tardy during current school year
. (School Records)

APPENDIX C

DISTRIBUTION OF EXPERIMENTAL GROUP RESPONSES
TO QUESTIONNAIRES I AND II

Item No. 1: Plans after high school

Item No. 2: Desired length of school day

Item No. 3: Desired length of summer vacation

Item No. 4: Grades expected on next report card

Item No. 5: Grades that could have been received

Item No. 6: Grades the students did receive

Item No. 7: List of items liked about school

Item No. 8: List of items disliked about school

Item No. 9: Opinion: I am very bright--not bright at all

Item No. 10: Opinion: Schoolwork is very easy--very hard

Item No. 11: Opinion: Getting good grades is very important--not at all important

Item No. 12: Opinion: To parents, getting good grades is very important--not at all important

Item No. 13: Opinion: I get better grades than no one in class--everyone in class

Item No. 14: Opinion: In terms of later life, grades are very related--not at all related

Item No. 15: Opinion: To most people, being brilliant is very important--not at all important

Item No. 16: Opinion: To me, being brilliant is very important--not at all important

Item No. 17: Opinion: To my friends, getting good grades is very important--not at all important

Item No. 1: What do you plan to do after graduation from high school?____________________

Future Plans Reported	Questionnaire I Responses (Pre)		Questionnaire II Responses (Post)	
	N	%	%	%
College and Graduate School	76	8.6	77	8.7
College	530	60.3	533	60.6
Junior College	8	0.9	8	0.9
Training Program and Job	22	2.5	20	2.3
Job and Night School	8	0.9	7	0.8
Military Service	23	2.6	24	2.7
Marriage	63	7.2	62	7.2
Undecided	149	17.0	146	16.8
Total	879	100.0	879	99.9
	$\bar{X}$ = 3.074 S.D. = 2.339		$\bar{X}$ = 3.089 S.D. = 2.336	

Item No. 2: Would you like to go to school each day for more time _____, the same time _____, or less time _____?

How much more or less time?__________________

Desired Change in Length of Day	Questionnaire I Responses (Pre)		Questionnaire II Responses (Post)	
	N	%	N	%
More than 2 hours shorter	68	7.7	93	10.6
1 - 2 hours shorter	33	3.8	48	5.5
1 - 59 minutes shorter	121	13.8	117	13.3
Same as now	586	66.7	553	62.9
1 - 59 minutes longer	27	3.1	27	3.1
1 - 2 hours longer	20	2.3	15	1.7
More than 2 hours longer	23	2.6	26	2.9
Total	879	100.0	879	100.0
	$\bar{X} = 3.710$		$\bar{X} = 3.596$	
	S.D. = 1.125		S.D. = 1.236	

Item No. 3: Would you like a summer vacation which is longer ____, about the same ____, or shorter ____?

How much longer or shorter?________________

Desired Change in Length of Summer Vacation	Questionnaire I Responses (Pre)		Questionnaire II Responses (Post)	
	N	%	N	%
More than a month longer	171	19.5	169	19.2
21 - 30 days longer	46	5.2	53	6.0
11 - 20 days longer	70	8.0	76	8.6
1 - 10 days longer	66	7.5	69	7.8
Same length as now	482	54.8	474	53.9
1 - 10 days shorter	8	0.9	5	0.6
11 - 20 days shorter	5	0.6	9	1.0
21 - 30 days shorter	7	0.8	10	1.1
More than a month shorter	23	2.6	14	1.6
Total	879	100.0	879	99.8
	$\bar{X} = 3.969$ S.D. = 1.855		$\bar{X} = 3.919$ S.D. = 1.816	

Item No. 4: Fill in the grades you think you will receive in these subjects on your next report card.

Average of Grades Listed	Questionnaire I Responses (Pre)		Questionnaire II Responses (Post)	
	N	%	N	%
90 or above	125	14.2	199	22.6
80 - 89	456	51.9	471	53.6
70 - 79	257	29.2	195	22.2
60 - 69	37	4.2	14	1.6
59 or below	4	0.5	0	0.0
Total	879	100.0	879	100.0
	$\bar{X}$ = 81.882		$\bar{X}$ = 84.206	
	S.D. = 6.762		S.D. = 6.486	

Item No. 5: Fill in the grades you think you could have received in these subjects if you had tried your hardest from the beginning of the course.

Average of Grades Listed	Questionnaire I Responses (Pre)		Questionnaire II Responses (Post)	
	N	%	N	%
90 or above	412	46.9	397	45.2
80 - 89	421	47.9	424	48.2
70 - 79	46	5.2	58	6.6
69 or below	0	0.0	0	0.0
Total	879	100.0	879	100.0
	$\bar{X}$ = 88.449		$\bar{X}$ = 88.339	
	S.D. = 5.154		S.D. = 5.429	

Item No. 6: (Questionnaire II only)

Fill in the grades you actually did receive in these courses on your last report card.

Average of Grades Listed	Questionnaire II Responses (Post)		Actual Grades from School Records	
	N	%	N	%
90 or above	131	14.9	142	16.2
80 - 89	409	46.5	408	46.4
70 - 79	260	29.6	264	30.0
60 - 69	68	7.7	57	6.5
59 or below	11	1.2	8	0.9
Total	879	99.9	879	100.0
	$\bar{X}$ = 81.557		$\bar{X}$ = 81.000	
	S.D. = 7.736		S.D. = 7.965	

Item No. 7: Please list below all of the things you

LIKE ABOUT SCHOOL

Number of Items Listed	Questionnaire I Responses (Pre) N	Questionnaire I Responses (Pre) %	Questionnaire II Responses (Post) N	Questionnaire II Responses (Post) %
0	26	3.0	32	3.6
1	61	6.9	75	8.5
2	175	19.9	182	20.7
3	242	27.5	288	32.8
4	200	22.8	165	18.8
5	145	16.5	110	12.5
6	26	3.0	17	1.9
7	2	0.2	4	0.5
8	2	0.2	5	0.6
9	0	0.0	1	0.1
Total	879	100.0	879	100.0
	$\bar{X} = 3.238$ S.D. = 1.390		$\bar{X} = 3.063$ S.D. = 1.411	

Item No. 8: Please list below all of the things you

DISLIKE ABOUT SCHOOL

Number of Items Listed	Questionnaire I Responses (Pre)		Questionnaire II Responses (Post)	
	N	%	N	%
0	59	6.7	54	6.1
1	184	20.9	192	21.8
2	257	29.2	227	25.8
3	206	23.4	202	23.0
4	109	12.4	122	13.9
5	57	6.5	66	7.5
6	6	0.7	11	1.3
7	1	0.1	4	0.5
8	0	0.0	0	0.0
9	0	0.0	1	0.0
Total	879	99.9	879	100.0
	$\bar{X} = 2.369$		$\bar{X} = 2.473$	
	S.D. = 1.341		S.D. = 1.439	

Item No. 9: Put an "X" in the box which best fits your opinion.

I am

VERY BRIGHT	☐	☐	☐	☐	☐	☐	☐	NOT BRIGHT AT ALL
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	

Number of Box "X"	Questionnaire I Responses (Pre)		Questionnaire II Responses (Post)	
	N	%	N	%
1	40	4.6	36	4.1
2	325	38.2	311	35.5
3	299	33.2	316	35.9
4	179	20.4	179	20.4
5	29	3.3	26	3.0
6	3	0.3	8	0.9
7	4	0.5	3	0.3
Total	879	100.1	879	100.1
	$\bar{X} = 2.940$ S.D. = 1.009		$\bar{X} = 2.926$ S.D. = 1.023	

Item No. 10: Put an "X" in the box which best fits your opinion.

Schoolwork for me is

VERY EASY	☐	☐	☐	☐	☐	☐	☐	VERY HARD
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	

Number of Box "X"	Questionnaire I Responses (Pre)		Questionnaire II Responses (Post)	
	N	%	N	%
1	35	4.0	31	3.5
2	175	19.9	188	21.4
3	246	28.0	242	27.5
4	260	29.6	278	31.6
5	108	12.3	91	10.4
6	39	4.4	38	4.3
7	16	1.8	11	1.3
Total	879	100.0	879	100.0
	$\bar{X} = 3.464$ S.D. = 1.277		$\bar{X} = 3.421$ S.D. = 1.222	

Item No. 11: Put an "X" in the box which best fits your opinion.

Getting good grades is

VERY IMPORTANT ☐ ☐ ☐ ☐ ☐ ☐ ☐ NOT AT ALL IMPORTANT

(1) (2) (3) (4) (5) (6) (7)

Number of Box "X"	Questionnaire I Responses (Pre)		Questionnaire II Responses (Post)	
	N	%	N	%
1	510	58.0	402	45.7
2	191	21.7	197	22.4
3	83	9.4	130	14.8
4	50	5.7	82	9.3
5	22	2.5	38	4.3
6	13	1.5	22	2.5
7	10	1.1	8	0.9
Total	879	99.9	879	99.9
	$\bar{X} = 1.819$ S.D. = 1.271		$\bar{X} = 2.151$ S.D. = 1.406	

Item No. 12: Put an "X" in the box which best fits your opinion.

To my parents, getting good grades is

VERY IMPORTANT	☐	☐	☐	☐	☐	☐	☐	NOT AT ALL IMPORTANT
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	

Number of Box "X"	Questionnaire I Responses (Pre)		Questionnaire II Responses (Post)	
	N	%	N	%
1	564	64.2	485	55.2
2	164	18.7	192	21.8
3	85	9.7	121	13.8
4	36	4.1	45	5.1
5	14	1.6	21	2.4
6	11	1.3	8	0.9
7	5	0.6	7	0.8
Total	879	100.2	879	100.0
	$\bar{X}$ = 1.662 S.D. = 1.129		$\bar{X}$ = 1.835 S.D. = 1.197	

Item No. 13: Put an "X" in the box which best fits your opinion.

I get better grades than

NO ONE IN CLASS	☐	☐	☐	☐	☐	☐	☐	EVERYONE IN CLASS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	

Number of Box "X"	Questionnaire I Responses (Pre)		Questionnaire II Responses (Post)	
	N	%	N	%
1	23	2.6	23	2.6
2	80	9.1	89	10.1
3	148	16.8	115	13.1
4	283	32.2	286	32.5
5	170	19.3	178	20.3
6	159	18.1	165	18.8
7	17	1.9	23	2.6
Total	879	99.9	879	100.0
	$\bar{X} = 4.185$ S.D. = 1.349		$\bar{X} = 4.242$ S.D. = 1.376	

Item No. 14: Put an "X" in the box which best fits your opinion.

In terms of later life, grades are

VERY RELATED	☐	☐	☐	☐	☐	☐	☐	NOT AT ALL RELATED
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	

Number of Box "X"	Questionnaire I Responses (Pre)		Questionnaire II Responses (Post)	
	N	%	N	%
1	363	41.3	295	33.6
2	157	17.9	186	21.2
3	112	12.7	141	16.0
4	81	9.2	94	10.7
5	66	7.5	76	8.6
6	60	6.8	45	5.1
7	40	4.6	42	4.8
Total	879	99.9	879	100.0
	$\bar{X} = 2.662$ S.D. = 1.852		$\bar{X} = 2.742$ S.D. = 1.779	

Item No. 15: Put an "X" in the box which best fits your opinion.

To most people, being brilliant is

VERY IMPORTANT	☐	☐	☐	☐	☐	☐	☐	NOT AT ALL IMPORTANT
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	

Number of Box "X"	Questionnaire I Responses (Pre)		Questionnaire II Responses (Post)	
	N	%	N	%
1	178	19.8	168	18.7
2	275	31.7	265	30.2
3	201	22.9	237	27.3
4	128	14.6	115	13.1
5	52	5.9	50	5.7
6	33	3.8	25	2.8
7	12	1.4	19	2.2
Total	879	100.1	879	100.0
	$\bar{X} = 2.828$ S.D. = 1.457		$\bar{X} = 2.848$ S.D. = 1.445	

Item No. 16: Put an "X" in the box which best fits your opinion.

To me, being brilliant is

VERY IMPORTANT	☐	☐	☐	☐	☐	☐	☐	NOT AT ALL IMPORTANT
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	

Number of Box "X"	Questionnaire I Responses (Pre)		Questionnaire II Responses (Post)	
	N	%	N	%
1	196	22.0	176	18.3
2	247	28.8	255	29.1
3	228	25.6	222	26.9
4	109	12.4	131	14.9
5	48	5.5	52	5.9
6	24	2.7	24	2.7
7	27	3.1	19	2.2
Total	879	100.1	879	100.0
	$\bar{X} = 2.825$ S.D. = 1.524		$\bar{X} = 2.916$ S.D. = 1.431	

Item No. 17: Put an "X" in the box which best fits your opinion.

To my friends, getting good grades is

VERY IMPORTANT	☐	☐	☐	☐	☐	☐	☐	NOT AT ALL IMPORTANT
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	

Number of Box "X"	Questionnaire I Responses (Pre)		Questionnaire II Responses (Post)	
	N	%	N	%
1	253	30.6	207	22.2
2	249	27.9	286	35.2
3	232	25.9	239	25.8
4	74	8.4	75	8.5
5	33	3.8	38	4.3
6	19	2.2	15	1.7
7	19	2.2	19	2.2
Total	879	100.0	879	100.0
	$\bar{X}$ = 2.707 S.D. = 1.557		$\bar{X}$ = 2.801 S.D. = 1.485	

APPENDIX D

SIGNIFICANT CORRELATED CHANGES IN ATTITUDE AND EXPECTANCY

1. Grade Expectancy and Estimation of Ability

   $r = .307, p < .001$ (N = 879)

   Students who lowered their expectancy for future grades similarly lowered their estimations of their own ability; students who raised their future expectancy for grades similarly raised their estimations of their own ability.

2. Length of School Day and Number of Items Liked About School

   $r = .200, p < .001$ (N = 879)

   Students who decreased their desired length of school day similarly decreased the number of items they listed as liking about school; students who increased their desired length of school day similarly increased the number of items they listed as liking about school.

3. Number of Items Liked About School and Number of Items Disliked About School

   $r = .211, p < .001$ (N = 879)

   Students who listed fewer items that they liked about school similarly listed fewer items that they disliked about school; students who listed more items that they disliked about school similarly listed more items that they disliked about school.

4. General Importance of Grades and Importance of Grades to Parents

   $r = .404, p < .001$ (N = 879)

   Students who thought grades more important than before similarly reported that their parents thought grades more important; students who thought grades less important similarly reported that their parents thought grades less important.

5. General Importance of Grades and Positon Relative to Class

   $r = .195, p < .01$ $(N = 879)$

   Students who thought grades more important than before thought they stood higher in their class; students who thought grades less important thought they stood lower in their class than before.

6. General Importance of Grades and Relation of Grades to Later Life

   $r = .159, p < .001$ $(N = 879)$

   Students who thought grades more important than before similarly thought that grades were more related to life; students who thought grades less important than before similarly thought grades less related to life.

7. General Importance of Grades and Estimation of Own Brightness

   $r = .159, p < .001$ $(N = 879)$

   Students who thought grades more important than before similarly thought that they were brighter; students who thought grades less important than before similarly thought that they were less bright.

8. Estimation of Own Brightness and Difficulty of Schoolwork

   $r = .157, p < .001$ $(N = 879)$

   Students who thought they were brighter than they had thought before also thought that schoolwork was easier; students who thought they were less bright than they had thought before thought that schoolwork was now harder.

9. Relation of Grades to Life and Personal Importance of Being Brilliant

$r = .161, p < .001$ (N = 879)

Students who thought grades more related to life than they had before similarly thought it more important to be brilliant; students who thought grades less related than they had before similarly thought it less important to be brilliant.

10. Personal Importance of Being Brilliant and Importance of Brilliance to Most People

$r = .338, p < .001$ (N = 879)

Students who thought it personally more important to be brilliant similarly reported that most people thought it more important to be brilliant; students who thought it personally less important to be brilliant similarly reported that most people thought it less important to be brilliant.